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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,406	01/06/2006	Seung-Woo Lee	PANK01642 US	5996
90323	7590	12/30/2010	EXAMINER	
Innovation Counsel LLP 21771 Stevens Creek Blvd Ste. 200A Cupertino, CA 95014			WILLIS, RANDAL L	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/535,406

**Applicant(s)**

LEE ET AL.

**Examiner**

RANDAL WILLIS

**Art Unit**

2629

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 July 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-10 and 12 is/are rejected.  
7) ☒ Claim(s) 11 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-942)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This office action is in response to application 10/535406 filed January 6<sup>th</sup> 2006.

Claims 1-12 are currently pending and have been examined.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 claims storing the image signals, however there are three sets of signals (first, second and modified) and it is unclear as to which are being stored. For examination purposes the limitation will read on storing the first, second and modified image signals.

Claim 7 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the multiplexer is changing the path of the signals going to the memory, when the signals are already stored in the memory. For

purposes of examination, the claim limitation will read " a multiplexer for changing a path of the image signals supplied to the memory unit."

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1,2, 3, 5, 6, 10 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Greier (2002/0149598) in view of Bae (5,808,706).

Apropos claim 1, Greier teaches:

A device of driving a liquid crystal display including a plurality of pixels connected to gate lines and data lines and arranged in a matrix (Abstract), the device comprising:

a gray voltage generator generating a plurality of gray voltages ([0014] invention uses LCD with full grayscale capability);

an image signal modifier receiving first image signals for a pixel row and second image signals for a next pixel row (Image signals for luminance of pixels A and B as shown in Fig. 22, the two pixels can be from adjacent rows [0091]), selecting modified image signal depending on the first image signals and the second image signals (Fig. 22 shows step of creating a modified signal using the average luminance of A and B), and out-putting the modified image signals; and

a data driver selecting data voltages from the gray voltages based on the modified image signals from the image signal modifier and applying the data voltages to the pixels (Last step of Fig. 22 outputs new values A' and B' to be driven)

wherein each pixel includes first and second subpixels ([0013])

However, Greier fails to explicitly teach:

Wherein the pixels include upper and lower pixels adjacent to each other, the second subpixel of the upper pixel is capacitively coupled with the first subpixel of the lower pixel.

In the same field of Liquid Crystal display devices, Bae teaches capacitively coupling the rows and columns of pixels, as can be seen in Fig. 13.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the caciitively connected pixels of Bae in the display device of Greier in order to reduce display deterioration (Col 2 lines 30-35)

Apropos claim 2, Greier teaches:

The device of claim 1, wherein the image signal modifier comprises a memory unit storing the first image signals or the second image signals ([0091] states a line memory would be required).

Apropos claim 3, Greier teaches:

The device of claim 2 wherein the image signal modifier stores the first image signals into the memory unit, and reads out the first image signals stored in the memory unit and stores the second image signals into the memory unit upon receipt of the second image signals (Inherent in line memory, which is being used [0091]).

Apropos claim 5, Greier teaches:

The device of claim 2, wherein the image signal modifier further comprises a data modifier that stores the modified image signals depending on the first image signals and the second image signals (Fig. 22 references a LUT which contains the modified images to be sent out).

Apropos claim 6, Greier teaches:

The device of claim 5, wherein the data modifier comprises a look-up table (halftone LUT, Fig. 22).

Apropos claim 10, Greier teaches:

The device of claim 1, wherein includes a switching element connected to one of the gate lines and one of the data lines (Switching TFTs inherent in active matrix LCD), and a pixel electrode connected to the switching element,

Apropos claim 12, Greier teaches:

A method of driving a liquid crystal display including a plurality of pixels the method comprising:

writing image data for a first pixel row into a memory ([0091]);

reading the image data for the first pixel row and writing image data for a second pixel row into the memory upon receipt of the image data for the second pixel row (Inherent in line memory, which is being used [0091]);

selecting modified image signals determined by the image signals for the first and the second pixel rows (Fig. 22 shows step of creating a modified signal using the average luminance of A and B); and

applying the modified image signals to the pixels through the switching elements (Last step of Fig. 22 outputs new values A' and B' to be driven)

However, Greier fails to explicitly teach:

Wherein the pixels include upper and lower pixels adjacent to each other, the second subpixel of the upper pixel is capacitively coupled with the first subpixel of the lower pixel.

In the same field of Liquid Crystal display devices, Bae teaches capacitively coupling the rows and columns of pixels, as can be seen in Fig. 13.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the capacitively connected pixels of Bae in the display device of Greier in order to reduce display deterioration (Col 2 lines 30-35)

Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Greier and Bae in view of Lee (2002/0180676).

Apropos claim 4, Greier fails to explicitly teach:

The device of claim 3, wherein the memory unit includes a dual- port memory provided with a read port and a write port.

In the same field of memory within a liquid crystal display, Lee teaches that the buffer memory can be composed of dual-port ram that can read and write simultaneously ([0090]).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use dual-port memory as taught by Lee as the line memory of Greier in order to allow a single memory to act as the line memory.



Claims 7-9 rejected under 35 U.S.C. 103(a) as being unpatentable over Greier and Bae in view of Terashima (7,023,413).

Apropos claim 7, Greier fails to explicitly teach:

The device of claim 2, wherein the image signal modifier further comprises a multiplexer for changing a path of the image signals supplied to the memory unit depending on the first image signals and the second image signals the memory unit.

However, in the same field of memory devices for storing video signals, Terashima teaches using multiplexer before and after two memory sections so that incoming image data can be stored in one memory while the other memory is read (See Fig. 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide multiplexers as taught by Terashima in the line memory of Greier in order to achieve with two single port memories the same functionality as a dual port memory that would be required.

Apropos claim 8, Greier fails to explicitly teach:

The device of claim 7, wherein the multiplexer changes the path in response to a control signal from an external device, and the control signal is synchronized with a

horizontal synchronization signal and a data enable signal having a period equal to a transmission time of the image signals for a pixel row.

However, examiner takes official notice that the synchronization of control signals with horizontal signals is well known in the art, and also with multiplexers for line memory, the control signal is commonly synchronized with the transmission time for the line the memory stores. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to synchronize the multiplexer in the combination of Greier and Terashima to the horizontal synchronization signal and the transmission time of the line memory in order to provided the correct timing for the line memory to read in the second image signal while reading out the first.

Apropos claim 9, Terashima further teaches:

The device of claim 7, wherein the memory unit comprises a pair of single port memories reading and writing in turn (Memories 1 and 8 can only read or write at any given time.).

***Allowable Subject Matter***

Claim 11 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RANDAL WILLIS whose telephone number is (571)270-1461. The examiner can normally be reached on Monday to Thursday, 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on 571-272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RLW

/Amr Awad/  
Supervisory Patent Examiner, Art Unit 2629